

Appl. No. 09/754,277
Amendment and/or Response
Reply to Office Action of December 24, 2003

Page 6 of 11

REMARKS/DISCUSSION OF ISSUES

Upon entry of the present amendment, claims 10-18 are pending in the application. Claims 10 and 14 are the independent claims.

Claim Objections

The objection to claim 19 is moot in view of its being cancelled.

Rejections

1. Claims 10-19 were rejected under 35 U.S.C. § 112, first paragraph. The Office Action asserts that these claims contain subject matter that was not described in the filed application. Specifically, the Office Action Asserts that the first or second plasma detecting device is not disclosed in the filed application.

Applicants respectfully traverse this rejection. In an embodiment disclosed in the application as filed in Fig. 5 first and second pressure gauges (13 and 14, respectively) to detect the presence of plasma (thus first and second plasma detectors). The first and second plasma detectors measure the pressure and provide a measure of the pressure differential via detection means 15. When the plasma enters the back of the gas introducing plate 4, a difference between the pressure on the backside of the gas-introducing plate and the pressure lying within the etching process chamber 9 becomes small. As such, the plasma detection is effected by these pressure gauges. Accordingly, it is respectfully submitted that this rejection is improper and should be withdrawn. (Kindly refer to page 11,

Atty. Docket No. OKI.201

Appl. No. 09/754,277
Amendment and/or Response
Reply to Office Action of December 24, 2003

Page 7 of 11

line 13 through page 15, line 22 for support for these assertions.)

2. Claims 3-9 were rejected under 35 U.S.C. § 103(a) as being unpatentable over applicant's admitted prior art (APA) in view of *Miyajima* (U.S. Patent 5,885,352). Claims 10 and 14 have been amended, and for at least the reasons that follow, it is respectfully submitted that these claims and the claims that depend therefrom are allowable over the applied art.

The establishment of a *prima facie* case of obviousness required that all of the elements of a claim be found in the prior art. It follows that if a single element of a claim is missing from the prior art, a *prima facie* case of obviousness cannot be properly established. Moreover, obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is a teaching, suggestion or motivation to do so found in the references relied upon.

Claims 10 and 14 are each drawn to an apparatus for manufacturing a semiconductor device. Claim 10 features:

"...a plasma detecting device wherein the parallel-plate dry-etching apparatus is adapted to cease operation if a pressure of a plasma measured by said plasma detecting device is lower than a predetermined value. ";

Furthermore, claim 14 features:

"...a first plasma detecting device, which measures a first pressure of a first plasma, provided inside of said upper electrode;

a second plasma detecting device, which measures a second pressure of a second plasma, provided within said dry etching

Atty. Docket No. OKI.201

Appl. No. 09/754,277
Amendment and/or Response
Reply to Office Action of December 24, 2003

Page 8 of 11

apparatus in which a wafer is placed...wherein, the apparatus is adapted to cease operation upon reaching a predetermined pressure differential."

As the Office Action notes, APA lacks the anticipation of a first plasma detecting device provided inside of said upper electrode between said gas-introducing plate and said cooling plate, wherein operation ceases if the pressure measured by the plasma detecting device is below a predetermined level.

Unfortunately, the reference to *Miyajima* fails to cure the deficiencies of the APA.

First, Applicants note that the adaptation of the apparatus to terminate operation on a pre-condition is a functional feature of claims 10 and 14. As such, the assertion of the Office Action that these claims include method steps is improper and should be withdrawn.

Second, the reference to *Miyajima* lacks the disclosure of *a plasma detecting device wherein the parallel-plate dry-etching apparatus is adapted to cease operation if a pressure of a plasma measured by said plasma detecting device is lower than a predetermined value*. To wit, the applied reference discloses flow-rate sensors 15 and photosensors 25, but does not disclose the determination of a pressure or the adaptation to cease operation if the pressure of the plasma is lower than a predetermined level.

Third, the reference to *Miyajima* lacks the disclosure of a first plasma detecting device, which measures a first pressure of a first plasma. Likewise the reference lacks the second plasma detecting device, which measures a second pressure of a second plasma. In a similar vein to the second assertion above, applied reference discloses flow-rate sensors 15 and

Atty. Docket No. OKI.201

Appl. No. 09/754,277
Amendment and/or Response
Reply to Office Action of December 24, 2003

Page 9 of 11

photosensors 25, but does not disclose the determination of a pressure or the adaptation to cease operation if the pressure of the plasma is lower than a predetermined level.

For at least these reasons, applicant respectfully submits that the rejections of claims 10 and 14 and the claims that depend therefrom in view of *Miyajimi* and APA are improper and should be withdrawn.

3. Claims 13-19 were rejected under 35 U.S.C. § 103(a) as being unpatentable over applicant's admitted prior art (APA) in view of *Miyajima* (U.S. Patent 5,885,352) in view of *Loan, et al.* (U.S. Patent 6,296,711 B1).

Applicants submit that the reference to *Loan, et al.* does not cure the deficiencies of *Miyajima* or APA. Thus, this rejection is improper for at least this reason. To this end, the reference to *Loan, et al.* lacks at least the disclosure that the apparatus is adapted to cease operation upon reaching a predetermined pressure differential, as set forth in independent claim 14.

Moreover, and as discussed in the Reply of August 5, 2003, the reference to *Loan, et al.* is drawn to a chemical vapor deposition (CVD) apparatus. As such, the apparatus to *loan* does not and would not include the featured plasma detection devices of independent claims 10 and 14. Accordingly, it is respectfully submitted that the applied art lacks at least one of the elements of independent claims 10 and 14. For at least this reason a *prima facie* case of obviousness cannot be established based on the applied art.

Moreover, and notwithstanding the traversal discussed immediately above, applicant respectfully traverses the propriety of the combination of *Loan, et al.* and APA. To this

Atty. Docket No. OKI.201

Appl. No. 09/754,277
Amendment and/or Response
Reply to Office Action of December 24, 2003

Page 10 of 11

end, claims 10-18 feature a plasma detector and plasma detectors. The reference to Loan, et al., being drawn to a CVD apparatus would not be useful to one skilled in the etching art in addressing the deficiencies of the plasma etching device of APA. To this end, the disciplines of plasma etching and CVD both relate to semiconductor processing, but are so far afield of one another, that one deft in the art of etching would not be motivated to combine a reference drawn to CVD to attempt to address the problems encountered in plasma etching.

For at least these reasons, applicant respectfully submits that the combination of Loan, et al. and APA is improper and should be withdrawn.

Accordingly, and for at least the reasons set forth above, claims 13-18 are allowable over the applied art.

Conclusion

In view of the foregoing, applicant(s) respectfully request(s) that the Examiner withdraw the rejections of record, allow all the pending claims, and find the application to be in condition for allowance. If any points remain in issue that may best be resolved through a personal or telephonic interview, the Examiner is respectfully requested to contact the undersigned at the telephone number listed below.

In the event that there are any outstanding matters remaining in the present application, the Examiner is invited to contact William S. Francos, Esq. (Reg. No. 38,456) at (610) 375-3513 to discuss these matters.

Petition is hereby made for a two-month extension of time under 37 C.F.R. §1.136 extending the period of reply to May 24, 2004. Permission is hereby given to charge Deposit Account Number 50-0238 for the required fee under 37 C.F.R. §1.17.

Atty. Docket No. OKI.201

Appl. No. 09/754,277
Amendment and/or Response
Reply to Office Action of December 24, 2003

Page 11 of 11

If necessary, the Commissioner is hereby authorized in this, concurrent, and further replies to charge payment or credit any overpayment to Deposit Account Number 50-0238 for any additional fees under 37 C.F.R. \$1.16 or under 37 C.F.R. \$1.17.

Respectfully submitted on behalf of:
Oki Electric Company, Ltd.



William S. Francos, Esq.
Reg. No. 38,456

Date: May 24, 2004

VOLENTINE FRANCOS, P.L.L.C.

12200 SUNRISE VALLEY DRIVE

SUITE 150

RESTON, VA 20191

Tel.: (703) 715-0870

Fax.: (703) 715-0877

Atty. Docket No. OKI.201